PBTs – Persistent Bioaccumulative Toxic Chemicals

There are 16 PBT chemicals and 4 PBT chemical compound categories that are subject to reporting under the EPCRA (Emergency Planning and Community Right-to-Know Act):

Four PBT chemical compound categories:

- Dioxin* and dioxin-like** compounds: Are either present as contaminants in the chemical or created in the manufacturing of plastics, bleaching of paper, etc.
- Lead and Lead Compounds
- Mercury compounds
- Polycyclic aromatic compounds (PACs)***

16 PBT chemicals:

Aldrin / Dieldrin	Methoxychlor
Benzo(g,h,i)perylene	Octachlorostyrene
Chlordane	Pendimethalin
Heptachlor	Pentachlorobenzene
Hexachlorobenzene	Polychlorinated biphenyl (PCBs)
Isodrin	Tetrabromobisphenol A
Lead	Toxaphene

Definition and explanation:

Persistent chemicals don't biodegrade quickly and stay in their current form for long periods in nature. Bioaccumulative chemicals amass in living tissue. So, they pose a threat to an ecosystem's food web, including in wetlands and fisheries. Once in the body, each chemical (or other chemicals produced by an organism's biological processes) can cause damage, such as cancer, brain and nervous system disorders, etc.

These toxic chemicals travel through the air, soil, and surface water, and end up in the tissues of the organisms that inhabit these media. These chemicals continue to bioaccumulate in the organism, causing damage to the organism itself. Then predators (including humans) consume these organisms, and chemicals also bioaccumulate in the predators, with the same damaging effects.

The US EPA has published a list of PBT (persistent bioaccumulative toxic) chemicals. As the TRI (Toxic Release Inventory) program evolved over time and as communities identified areas of special concern, thresholds for PBTs have been lowered, ensuring the public would have information on any potentially threatening releases. Some, such as dioxin, have lower thresholds than others. Dioxin's reporting threshold is .1 grams, due to its widespread release in industrial practices and health threat.

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* Dioxin is a highly toxic industrial by-product of industrial processes involving chlorine. Sources of dioxin include paper and pulp mills, hazardous waste incineration, sludge from waste facilities, cement kilns that burn chemical waste, and the manufacturing of PVC plastics and some pesticides. The human health effects from exposure to dioxin include cancer, birth defects, learning disabilities, endometriosis, infertility, suppressed immune functions, and reduced IQs in children.

** “Dioxin-like” means have a similar chemical structure, similar physical-chemical properties, and invoke a common battery of toxic responses.

*** Polycyclic aromatic compounds (PACs) are a subset of a broad class of chemicals identified as polycyclic organic matter (POM). POM, a complex mixture containing thousands of organic compounds, is found in fossil fuels, oil, coal, wood, and natural gas. POM is also found as suspended particulate matter in the urban atmosphere, from the incomplete combustion/pyrolysis of fuels (coal, oil, natural gas, and wood).

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